

L.—*On the Species of Polypterus.*

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IN a paper published in the 'Denkschriften' of the Vienna Academy, 1881, Steindachner has shown that the three species from the Nile, which had been well distinguished by earlier authors and unfortunately united by Günther, are perfectly distinct, and the concise descriptions he has given of *Polypterus senegalus*, Cuv., *bichir*, Geoffr., and *Endlicheri*, Heck., accompanied by excellent figures, leave little to be desired. The forms occurring in West Africa have not been considered on that occasion, an omission the more regrettable from the fact that they seem to bridge over the differences so readily perceptible in dealing with the Nile species. Having experienced some difficulty in the determination of specimens from the Niger and the Congo, I have found it necessary to review the whole material preserved in the British Museum. This work has resulted in a more rigid definition of the West-African species and in the addition of two new species from the Congo. Although, in spite of Steindachner's observations, several authors have continued to designate specimens under the collective name of *P. bichir*, the specific distinction of the various forms cannot be questioned, for, even if there be a continuous chain connecting the specimens with 5 dorsal spines with those with as many as 18, examination of large series shows the range of variation in the number of spines never to exceed 4 in specimens otherwise similar, the differences in these numbers being accompanied by others which cannot even be regarded as correlative. Most of the species could be identified from specimens stripped of their dorsal fin. For instance, the number of dorsal spines is not correlated with the elongation of the body, nor is this with the number of scales in the lateral line. The head also furnishes important specific characters.

In order to enable the reader to form a better idea of the amount of variation within the limits of a species, I have recorded the numbers of spines and scales and the proportions of the head in all the specimens at my disposal. The figures are arranged in four columns, which read as follows:—

- A. Number of spines in the dorsal fin.
- B. Number of scales between the upper extremity of the opercle and the middle rays of the caudal fin.
- C. Length of the head compared to its width in front of the opercular bones.
- D. Length of the head to the extremity of the opercular bone in the total length, caudal fin excluded.

Synopsis of the Species.

I. Mandible projecting very slightly beyond the snout ; subopercle larger than the eye ; dorsal with 12 to 18 spines ; pectoral extending as far as first dorsal spine or beyond ; 42-52 scales round middle of body.

A. 60 to 68 scales along the body.

15 to 18 dorsal spines ; head $1\frac{3}{4}$ to 2 as long as broad, 5 to $5\frac{2}{3}$ times in total length ; interorbital region slightly convex 1. *P. bichir*.

14 dorsal spines, rarely 13 or 15 ; head 2 to $2\frac{1}{5}$ as long as broad, $4\frac{1}{4}$ to 5 times in total length ; interorbital region flat 2. *P. Lapradii*.

B. 54 to 57 scales along the body ; head $1\frac{1}{2}$ to $1\frac{3}{4}$ as long as broad.

13 or 14 dorsal spines ; head 4 to $4\frac{2}{3}$ times in total length ; an azygos shield between the nasals 3. *P. congicus*.

12 or 13 dorsal spines ; head $4\frac{1}{3}$ to $5\frac{2}{3}$ times in total length ; all the head-shields paired 4. *P. Endlicheri*.

II. Snout projecting very slightly beyond the mandible ; subopercle smaller than the eye ; dorsal with 5 to 10 spines ; pectoral not reaching first dorsal spine ; head $1\frac{2}{3}$ to 2 as long as broad.

9 dorsal spines ; 57 scales along the body, 44 round the middle ; head $4\frac{1}{2}$ times in total length 5. *P. Weeksii*.

8 to 10 dorsal spines ; 55 to 59 scales along the body, 36 to 38 round the middle ; head $5\frac{2}{3}$ to 7 times in total length 6. *P. senegalus*.

5 to 8 dorsal spines ; 52 to 55 scales along the body ; head $4\frac{1}{2}$ to $5\frac{2}{3}$ times in total length 7. *P. palmas*.

1. *Polypterus bichir*, Geoffr.

Head $1\frac{3}{4}$ to 2 as long as broad, 5 to $5\frac{2}{3}$ times in total length ; interorbital region slightly convex ; all the head-shields paired ; subopercle larger than the eye ; mandible projecting very slightly beyond the snout. Dorsal spines 15-18, anterior 5 or 6 times as long as broad, overlapping when folded. Pectoral reaching first dorsal spine or a little beyond. 60-68 scales along the body, 46-50 round the middle. Body with more or less distinct dark stripes and cross-bars ; fins spotted or streaked.

Total length 570 millim.

Nile, Senegal, Gambia.

	A.	B.	C.	D.
1. Cairo	XVIII	65	2	$5\frac{1}{2}$
2. Nile	XVI	67	2	$5\frac{1}{2}$
3. "	XV	67	2	5
4. Senegal	XV	68	2	$5\frac{2}{3}$
5. Gambia	XV	63	2	5
6. W. Africa	XV	60	$1\frac{4}{5}$	$5\frac{2}{5}$
7. "	XV	63	$1\frac{4}{5}$	5
8. — ?	XVII	65	$1\frac{3}{4}$?

2. *Polypterus Lapradii*, Sldr.

Head 2 to $2\frac{1}{5}$ as long as broad, more depressed than in *P. bichir*, $4\frac{1}{4}$ to 5 times in total length; interorbital region flat; all the head-shields paired; subopercle larger than the eye; mandible projecting very slightly beyond the snout. Dorsal spines 13-15, usually 14, slender, 5 or 6 times as long as broad, overlapping when folded. Pectoral reaching first dorsal spine or a little beyond. 61-66 scales along the body, 48-52 round the middle of the body. Body with more or less distinct dark stripes and cross-bars; fins spotted or streaked.

Total length 520 millim.

Senegal, Niger.

	A.	B.	C.	D.
1. Niger	XIV	62	$2\frac{1}{6}$	$4\frac{1}{4}$
2. "	XIV	61	$2\frac{1}{6}$	5
3. "	XIV	62	$2\frac{1}{6}$	$4\frac{1}{5}$
4. "	XIII	63	2	$4\frac{2}{3}$
5. "	XIV	64	2	$4\frac{2}{3}$
6. "	XIV	66	$2\frac{1}{5}$	$4\frac{1}{3}$
7. "	XIV	66	2	$4\frac{2}{3}$
8. "	XV	65	$2\frac{1}{5}$	$4\frac{2}{3}$
9. W. Africa	XIV	64	2	5

3. *Polypterus congicus*, sp. n.

Head $1\frac{1}{2}$ to $1\frac{3}{4}$ as long as broad, 4 to $4\frac{2}{3}$ times in total length; interorbital space flat; a small azygos shield between the nasals; subopercle larger than the eye; mandible projecting very slightly beyond the snout. Dorsal spines 13 or 14, anterior 4 or 5 times as long as broad, overlapping when folded. Pectoral reaching first dorsal spine or beyond. 55-57 scales along the body, 48-50 round the middle. Body with 6 or 7 more or less regular, narrow, dark cross-bars; fins spotted or streaked.

Total length 720 millim.

Congo.

Specimens with external gills have been exhibited by me at a recent meeting of the Zoological Society under the erroneous name of *P. Lapradii*, Sldr. (cf. P. Z. S. 1898, p. 493).

	A.	B.	C.	D.
1. Stanley Falls	XIV	55	$1\frac{2}{3}$	$4\frac{2}{3}$
2. New Antwerp	XIV	57	$1\frac{3}{4}$	4
3. Leopoldville	XIII	57	$1\frac{3}{4}$	$4\frac{1}{5}$
4. Manyanga	XIII	57	$1\frac{1}{2}$	$4\frac{1}{2}$

4. *Polypterus Endlicheri*, Heckl.

Head $1\frac{1}{2}$ to $1\frac{3}{4}$ as long as broad, $4\frac{4}{5}$ to $5\frac{2}{3}$ times in total

length; interorbital space flat or slightly concave; all the head-shields paired; mandible projecting very slightly beyond the snout. Dorsal spines 12 or 13, anterior scarcely overlapping when folded, 3 or 4 times as long as broad. Pectoral reaching first dorsal spine or beyond. 54-56 scales along the body, 42-46 round the middle. Body with 4 or 5 more or less regular dark cross-bars; fins spotted or streaked.

Total length 50 millim.

Upper Nile, West Africa?

	A.	B.	C.	D.
1. Chartoum	XII	54	$1\frac{2}{3}$	$5\frac{3}{5}$
2. Nile	XIII	56	$1\frac{2}{3}$	$4\frac{2}{5}$
3. W. Africa	XIII	56	$1\frac{2}{3}$	5
4. "	XII	56	$1\frac{2}{3}$	$5\frac{1}{3}$
5. "	XII	55	$1\frac{2}{3}$	5

5. *Polypterus Weeksii*, sp. n.

Head $1\frac{3}{4}$ as long as broad, $4\frac{1}{2}$ times in total length; interorbital region slightly convex; all the head-shields paired; snout projecting very slightly beyond the mandible; suboperculum very small, smaller than the eye. Dorsal spines 9, anterior 3 to $3\frac{1}{2}$ times as long as broad, not overlapping when folded. Pectoral widely separated from dorsal fin. 57 scales along the body, 44 round the middle, all with granular asperities. Dark olive above, yellow beneath, the two colours sharply delimited on the side; six narrow black bars across the back, with some black spots between them, the last followed by irregular marblings; a large black spot on the membrane to each dorsal spine; soft fins with dark and light spots; pectoral with three blackish cross-bands.

This species is founded on a single young specimen with external gills, measuring 170 millim., recently obtained at Monsembe, Upper Congo, and presented to the British Museum by the Rev. J. H. Weeks, in whose honour it is named.

In the reduction of the suboperculum this and the following species lead to *Calamichthys*, in which the bone has entirely disappeared.

6. *Polypterus senegalus*, Cuv.

Head $1\frac{2}{3}$ to 2 as long as broad, $5\frac{3}{4}$ to 7 times in total length; interorbital region convex; all the head-shields paired; subopercle smaller than the eye; snout projecting slightly beyond the mandible. Dorsal spines 8-10, anterior separated from each other when folded, 3 to 4 times as long as broad. Pectoral widely separated from dorsal fin. 53-59

scales along the body, 36-38 round the middle. No markings, even in the young.

Total length 300 millim.

Nile, Lake Rudolf, Senegal, Gambia, Niger.

	A.	B.	C.	D.
1. Nile	X	58	$1\frac{2}{3}$	7
2. "	IX	59	$1\frac{3}{4}$	$6\frac{2}{3}$
3. "	X	59	$1\frac{3}{4}$	7
4. "	IX	57	$1\frac{3}{4}$	$6\frac{1}{2}$
5. "	IX	58	$1\frac{3}{4}$	$6\frac{1}{2}$
6. Senegal	X	58	$1\frac{2}{3}$	6
7. Gambia	VIII	57	2	6
8. "	X	58	$1\frac{4}{5}$	6
9. "	VIII	58	2	$5\frac{3}{4}$
10. Sierra Leone.....	VIII	57	$1\frac{2}{3}$	6
11. Niger.....	IX	57	2	$6\frac{1}{2}$
12. "	IX	57	2	$6\frac{1}{2}$
13. "	X	59	2	$6\frac{1}{3}$
14. "	X	59	2	$6\frac{1}{4}$
15. "	X	55	2	6
16. "	IX	56	2	6
17. W. Africa	X	57	2	$6\frac{1}{3}$
18. "	IX	58	2	$6\frac{1}{4}$
19. "	IX	58	2	$5\frac{4}{5}$
20. "	IX	58	2	6
21. "	IX	57	$1\frac{4}{5}$	$6\frac{1}{4}$
22. "	IX	59	2	6
23. "	X	56	$1\frac{3}{4}$	$6\frac{1}{3}$

7. *Polypterus palmas*, Ayres.

Head $1\frac{3}{4}$ to 2 as long as broad, $4\frac{1}{2}$ to $5\frac{2}{3}$ times in total length; interorbital region convex; all the head-shields paired; subopercle smaller than the eye; snout projecting slightly beyond the mandible. Dorsal spines 5 to 8, anterior separated from each other when folded, 3 to $3\frac{1}{2}$ times as long as broad. Pectoral widely separated from dorsal fin. 52 to 55 scales along the body, 36-38 round the middle. Above with dark marblings enclosing light spots, these markings more distinct in the young.

Total length 290 millin.

Liberia, Cape Palmas, Congo.

This species is nearly completely connected with *P. senegalus*.

	A.	B.	C.	D.
1. Lower Congo	VII	55	$1\frac{4}{5}$	$5\frac{1}{2}$
2. Mangala, Upper Congo	VII	54	$1\frac{3}{4}$	$4\frac{3}{4}$
3. " " "	VI	52	$1\frac{3}{4}$	$4\frac{1}{2}$
4. " " "	V	53	$1\frac{3}{5}$	$4\frac{1}{2}$
5. Monsembe, Upper Congo ..	VI	55	$1\frac{3}{4}$	5
6. Stanley Falls	VI	53	2	$5\frac{2}{3}$